

REMARKS

In the Final Office Action¹ identified above, the Examiner:

- a) rejected claims 1, 4, and 6-9 under 35 U.S.C. § 103(a) as being unpatentable over Abe et al. (U.S. Patent No. 6,784,021, "Abe") in view of He (U.S. Patent No. 6,620,651, "He"), Nam et al. (U.S. Patent Application Publication No. 2002/0109217, "Nam"), and Rogowski (U.S. Patent No. 5,684,707, "Rogowski"), and either Jeong et al. (U.S. Patent No. 7,051,428 B2, "Jeong") or Kretz et al. (U.S. Patent No. 6,665,583 B2, "Kretz");
- b) rejected claims 2, 3, 12, and 13 under 35 U.S.C. § 103(a) as being unpatentable over Abe in view of He, Nam, Rogowski, and either Jeong or Kretz, and further in view of Sasaki et al. (U.S. Patent No. 6,294,439, "Sasaki");
- c) rejected claims 10 and 11 under 35 U.S.C. § 103(a) as being unpatentable over Abe in view of He, Nam, Rogowski, and either Jeong or Kretz, and further in view of either Wojewnik et al. (U.S. Patent No. 6,640,434, "Wojewnik") or Varaprasad et al. (U.S. Patent No. 5,910,854 , "Varaprasad");

¹ The Final Office Action contains statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicant declines to automatically subscribe to any statement or characterization in the Final Office Action.

- d) rejected claim 14 under 35 U.S.C. 103(a) as being unpatentable over Abe in view of He, Nam, Rogowski, and either Jeong or Kretz, and further in view of Bura et al. (U.S. Patent No. 4,489,487, "Bura");
- e) rejected claims 15 and 16 under 35 U.S.C. 103(a) as being unpatentable over Abe in view of He, Nam, Rogowski, and either Jeong or Kretz, and further in view of Cobbley et al. (U.S. Patent Application Publication No. 2004/0154956A1, "Cobbley"); and
- f) rejected claims 17 and 18 under 35 U.S.C. 103(a) as being unpatentable over Abe in view of He, Nam, Rogowski, and either Jeong or Kretz, and further in view of Oki et al. (U.S. Patent No. 5,605,844, "Oki").

Claims 1, 4, and 6-9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Abe in view of He, Nam, Rogowski, and either Jeong or Kretz. Applicant respectfully traverses the Examiner's rejection.

The key to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. See M.P.E.P. § 2142, 8th Ed., Rev. 6 (Sept. 2007). Such an analysis should be made explicit and cannot be premised upon mere conclusory statements. See id. "A conclusion of obviousness requires that the reference(s) relied upon be enabling in that it put the public in possession of the claimed invention." M.P.E.P. § 2145. Furthermore, "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art" at the time the invention was made. M.P.E.P. § 2143.01(III),

internal citation omitted. Moreover, “[i]n determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious.” M.P.E.P. § 2141.02(l), internal citations omitted (emphasis in original). In this application, a *prima facie* case of obviousness has not been established because the Examiner has not clearly articulated a reason why one of ordinary skill would find the claimed combination obvious in view of the cited references.

Regarding independent claim 1, for example, the Examiner argued that the combination of Abe, He, Nam, Rogowski, and Jeong or Kretz renders obvious the method recited in claim 1. See Final Office Action at pages 2-4. Applicants respectfully disagree.

Applicant submits that one of ordinary skill in the art would not have arrived at the combination of claim 1 including, at least, “placing the picked-up first and second semiconductor elements held by the adsorption collet on the sectioned element adhesive film held by the porous adsorption member in order of their sectioning,” and “sticking the sectioned element adhesive film held by the porous adsorption member to each of the back surfaces of the first and second semiconductor elements held by the adsorption collet,” based on the prior art. Furthermore, the prior art references fail to render obvious “pressing the sectioned adhesive film held by the porous adsorption member against the first and second semiconductor elements held by the adsorption collet” to stick the sectioned adhesive film to the semiconductor elements.

In the manufacturing method of claim 1 and the manufacturing apparatus of claim 6, first and second semiconductor elements have a thickness of 20 μm or more and 100 μm or less. In a conventional process, when a semiconductor wafer on a die bonding tape (element adhesive film) is diced, the blade becomes clogged, resulting in large chippings on the back surface of the diced semiconductor elements. Thin semiconductor elements, having the thickness of 20 μm or more and 100 μm or less, especially tend to generate these chippings when the blade is clogged.

For this reason, the method and the apparatus of the present invention carries out "sectioning semiconductor elements having the thickness of 20 μm or more and 100 μm or less from a semiconductor wafer" and "cutting an element adhesive film to form a sectioned element adhesive film" separately. Afterwards, the sectioned element adhesive film is stuck on the back surface of sectioned semiconductor element having a thickness of 20 μm or more and 100 μm or less.

Furthermore, in sticking the sectioned element adhesive film on the back surface of sectioned semiconductor element, incomplete adherence often occurs, resulting in unadhered portions of the adhesive film. Thus, when adhering thin semiconductor elements on a semiconductor device, it is important to press the sectioned adhesive film held by a porous adsorption member to a semiconductor element held by a adsorption collet to stick the sectioned adhesive film to the semiconductor element in order to ensure complete adherence. Claim 1 thus comprises the steps of "placing the picked-up first and second semiconductor elements held by the adsorption collet on the sectioned element adhesive film held by the porous adsorption member" and "sticking

the sectioned element adhesive film held by the porous adsorption member to each of the back surface of the first and second semiconductor elements held by the adsorption collet by pressing the sectioned element adhesive film held by the porous adsorption member against the first and second semiconductor elements held by the adsorption collet" (emphases added).

The Examiner has not clearly articulated a reason why one of ordinary skill would find the claimed combination obvious in view of the cited references. Abe describes a "chip 3b having a back surface coated with a bonding layer 7b" and a "chip 3a having a back surface coated with a bonding layer 7a." See Abe, col. 3, lines 57-58 and 61-62. Thus, Abe does not teach or suggest "sticking the sectioned element adhesive film held by the porous adsorption member to each of the back surface of the first and second semiconductor element held by the adsorption collet by pressing the sectioned element adhesive film held by the porous adsorption member against the first and second semiconductor elements held by the adsorption collet," as recited in claim 1. (emphases added) He teaches that a semiconductor die 40 is stuck to an adhesive 10 laminated onto a substrate 30. See col. 3, lines 33-38. In such a bonding method, unadhered portion between the semiconductor die 40 and the adhesive 10 would be easily generated. Moreover, when adhering a second semiconductor element on the first semiconductor element, a good adhesion cannot be obtained by merely placing the second semiconductor element to the adhesive laminated onto the first semiconductor element. Nam teaches that a tape cutter 48 is used to cut an adhesive tape 68 while a tape holder 50 holds the tape 68. See paragraph [0028]. However, even assuming that

the tape cutting apparatus of Nam can be used to cut the adhesive 10 of He, the adhesion between the semiconductor die 40 and the adhesive 10 in He would not be improved. Further, each of Rogowski, Jeong, and Kretz also fail to teach or suggest the claimed placing and sticking steps. Indeed, the Examiner did not cite these references to teach such steps.

In view of the above deficiencies, the Examiner has not articulated a reason why the claimed combination would be obvious to one of ordinary skill. Therefore, the rejection is improper.

Accordingly, no *prima facie* case of obviousness has been established regarding claim 1 and claim 6, which recites elements that are similar to those recited in claim 1. Claims 4 and 7-9 are allowable at least due to their dependence. The Examiner should withdraw the rejection of claims 1, 4, and 6-9 under 35 U.S.C. § 103(a).

Applicant also respectfully traverses the remaining rejections under 35 U.S.C. § 103(a). The Examiner applied each of Sasaki, Wojewnik, Varaprasad, Bura, Cobbley, and Oki as allegedly teaching elements recited in dependent claims 2, 3, and 10-18. However, these references, even if combined with Abe, He, Nam, Rogowski, and Jeong or Kretz, do not teach or suggest “placing the picked-up semiconductor element held by the adsorption collet on the sectioned element adhesive film held by the porous adsorption member” and “sticking the sectioned element adhesive film held by the porous adsorption member to the back surface of the semiconductor element held by the adsorption collet by pressing the sectioned element adhesive film held by the porous adsorption member against the semiconductor element held by the adsorption

collet," as recited in claim 1 and similarly recited in claim 6. Nor has the Examiner articulated a reason why these additional references would render obvious the combination recited in claims 1 and 6. Therefore, no *prima facie* case of obviousness has been established regarding independent claims 1 and 6, from which claims 2, 3, and 10-18 depend. The Examiner should therefore withdraw the rejections of claims 2, 3, and 10-18 under 35 U.S.C. § 103(a).

In view of the foregoing, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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